IN THE CLAIMS:

1-336 (Previously Cancelled).

337. (Currently Amended) A laser radiation source for generating laser beams ~~with high power density and high energy~~ for processing material by engraving cups in a processing surface thereof, comprising:

at least one diode-pumped fiber laser;

each fiber laser comprising at least one output;

at least two of said outputs being arranged in a first ordering pattern; ~~and~~

the laser beams emerging from the outputs of the individual fiber lasers being at least one of shaped and aligned such that they impinge onto ~~a~~ said processing surface in a second ordering pattern for engraving said cups; and

said emerging laser beams having a power density and energy sufficiently high to erode material from said processing surface for creating said cups.

338. (Original) The laser radiation source according to claim 337 wherein the outputs of the fiber lasers are arranged in at least one of at least one track next to one another and in at least one plane above one another for forming the first ordering pattern.

339. (Original) The laser radiation source according to claim 337 wherein the outputs of the fiber lasers are arranged in a bundle for forming the first ordering pattern.

340. (Original) The laser radiation source according to claim 337 wherein the laser beams are combined and bundled for forming the second ordering pattern

such that the laser beams generate processing points on the processing surface lying next to one another in at least one of at least one track and lying above one another in at least one plane.

341. (Original) The laser radiation source according to claims 337 wherein the laser beams are combined and bundled for forming the second ordering pattern such that the laser beams generate a single processing point on the processing surface.

342. (Original) The laser radiation source according to claim 337 wherein for at least one of shaping and aligning the laser beams, the outputs of the fiber lasers are correspondingly at least one of aligned and optically processed.

343. (Currently Amended) The laser radiation source according to claim 337 wherein at least one optical unit is connected to the outputs of the fiber lasers <u>for</u> at least one of ~~for~~ the shaping and the alignment of the laser beams.

344. (Original) The laser radiation source according to claim 337 wherein the laser beams generated in the fiber lasers are directly modulated.

345. (Original) The laser radiation source according to claim 343 wherein at least one modulation device is provided in the optical unit for the modulation of the laser beams.

346. (Original) The laser radiation source according to claim 345 wherein the modulation device is designed as at least one of a single-channel electro-optical modulator, a multi-channel electro-optical modulator and an electro-optical deflector.\

347. (Original) The laser radiation source according to claim 345 wherein the modulation device is designed as at least one of a single-channel acousto-optical modulator, a multi-channel acousto-optical modulator and an acousto-optical deflector.

348. (Original) The laser radiation source according to claim 345 wherein the laser beams entering into the modulation device are split into at least two sub-beams that generate the processing points on the processing surface.

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349. (Original) The laser radiation source according to claim 343 wherein:

the outputs of the fiber lasers are coupled to the optical unit with terminators; and

the terminators comprise lenses for shaping the laser beams into beam bundles.

350. (Original) The laser radiation source according to claim 349 wherein:

the optical unit comprises a radiation entry and a radiation exit; and

mounts are provided at the radiation entry, the terminators being accepted in said mounts such that the beam bundles at the radiation exit of the optical unit are directed onto the processing surface.

351. (Original) The laser radiation source according to claim 349 wherein the terminators are adjustable in the mounts.

352. (Original) The laser radiation source according to claim 337 wherein the output of at least one fiber laser comprises at least one passive fiber.

353. (Original) The laser radiation source according to claim 343 wherein:

the optical unit comprises a radiation entry and a radiation exit; and

the optical unit comprises an optical unit in the region between radiation entry and radiation exit for merging the laser beams.

354. (Original) The laser radiation source according to claim 353 wherein the optical unit for merging the laser beams are arranged in the beam path at one of in front of and behind the modulation device.

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355. (Original) The laser radiation source according to claim 343 wherein the optical unit comprises a unit for reducing a spacing of symmetry axes of the laser beams.

356. (Original) The laser radiation source according to claim 343 wherein the optical unit comprises a transmission unit for optical transmission of the laser beams onto the processing surface.

357. (Original) The laser radiation source according to claim 356 wherein the optical transmission unit contains an interchangeable objective.

358. (Original) The laser radiation source according to claim 343 wherein the optical unit is designed so that the laser beams form beam constrictions in a region of the processing surface.

359. (Original) The laser radiation source according to claim 343 wherein the optical unit comprises an adjustable lens with a long focal length compared to an objective with which focusing of the processing points onto the processing surface is variable.

360. (Original) The laser radiation source according to claim 343 wherein the optical unit comprises an adjustable vario objective with which at least one of the focusing of the processing points onto the processing surface and the spacing between the processing points is variable.

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361. (Original) The laser radiation source according to claim 337 wherein the laser radiation source comprises a unit with which unwanted laser radiation that should not produce a processing effect on the processing surface are rendered ineffective.

362. (Original) The laser radiation source according to claim 361 wherein the laser radiation source comprises an intercept arrangement with which unwanted laser radiation is kept away from the processing surface.

363. (Original) The laser radiation source according to claim 362 wherein the intercept arrangement comprises a sump into which the unwanted laser radiation is conducted.

364. (Original) The laser radiation source according to claim 363 wherein the sump comprises a material that absorbs the unwanted laser radiation.

365. (Original) The laser radiation source according to claim 363 wherein the sump is designed as a heat exchanger.

366. (Original) The laser radiation source according to claim 361 wherein the unwanted laser radiation is conducted into a sump with at least one mirror.

367. (Original) The laser radiation source according to claim 366 wherein an optical element that retains laser radiation at least one of reflected and back-scattered from the sump is inserted between the mirror and the sump.

368. (Original) The laser radiation source according to claim 361 wherein the laser radiation source comprises a system with which the unwanted laser radiation is spread over an adequately large region of the processing surface such that it produces no processing effect on the processing surface.

369. (Original) The laser radiation source according to claim 343 wherein at least one of the optical unit and parts thereof comprise a system that prevents a contamination of the optical components.

370. (Original) The laser radiation source according to claim 369 wherein at least one of the optical unit and parts thereof are free of materials that give off gasses.

371. (Original) The laser radiation source according to claim 369 wherein at least one of the optical unit and parts thereof are closed gas-tight and comprises optical windows for passage of the laser beams.

372. (Original) The laser radiation source according to claim 369 wherein at least one of the optical unit and parts thereof are evacuated.

373. (Original) The laser radiation source according to claim 369 wherein at least one of the optical unit and parts thereof are at least one of filled with a protective atmosphere and have protective atmosphere flowing therethrough.

374. (Original) The laser radiation source according to claim 343 wherein an arrangement for removal of the material eroded from the processing surface is provided between the optical unit and the processing surface.

375. (Original) The laser radiation source according to claim 374 wherein:

the arrangement for removal of the material eroded from the processing surface comprises a through opening with a beam entry and a beam exit for the laser beams directed onto the processing surface, whereby a processing space is formed between beam exit and processing surface;

at least one extraction channel connected to the processing space is provided; and

the extraction channel is in communication with a vacuum generating unit.

376. (Original) The laser radiation source according to claim 375 wherein the through opening between beam entry and the processing space is designed constricted toward the beam exit.

377. (Original) The laser radiation source according to claim 374 wherein the arrangement comprises at least one compressed air channel whose one opening is connected to a processing space and whose other opening is connected to a generating device for at least one of compressed air and gas.

378. (Original) The laser radiation source according to claim 377 wherein:

the compressed air channel is designed as a nozzle bore; and

an axis of the nozzle bore is directed onto the processing points.

379. (Original) The laser radiation source according to claim 377 wherein the arrangement comprises at least one bypass bore connected to the compressed air generating device.

380. (Original) The laser radiation source according to claim 379 wherein the bypass bore is arranged such that an air flow in the direction of the processing surface arises in the through opening.

381. (Original) The laser radiation source according to claim 375 wherein a filter device for picking up the material released during the processing of material is provided between the extraction channel and the vacuum generating device.

382. (Original) The laser radiation source according to claim 337 wherein at least one control circuit for regulating the laser beams is provided.

383. (Currently Amended) The laser radiation source according to claim 337 wherein continuous wave lasers are provided for generating the laser beams, said continuous wave lasers being respectively capable of being modulated with a modulator arranged outside the laser resonator, with at least one of the pump energy and directly.

384. (Original) The laser radiation source according to claim 337 wherein quality-switched lasers are provided for generating the laser beams, said quality-switched lasers being respectively capable of being modulated with at least one of a modulator arranged outside the laser resonator, with pump energy, with a Q-switch and directly.

385. (Original) The laser radiation source according to claim 337 wherein the laser radiation source is employed in an apparatus for processing material, specifically in an apparatus for producing printing forms.

386. (Currently Amended) An apparatus for processing material with laser radiation ~~having high power density and high energy~~ in order to engrave cups in at least one processing surface of the material, comprising:

at least one laser radiation source for generating laser beams for processing the at least one processing surface by engraving the cups therein;

the laser radiation source comprising at least one diode-pumped fiber laser;

each fiber laser comprising at least one output;

at least two of said outputs being provided;

the outputs of the fiber lasers being arranged in a first ordering pattern;

the laser beams emerging from the outputs of the individual fiber lasers being at least one of shaped and directed such that they impinge ~~a~~ said processing surface in a second ordering pattern;

the laser beams having a power density and energy sufficiently high to erode the material to engrave said cups;

~~a cooling system for cooling the laser radiation source;~~

a controller for controlling the laser radiation source;

at least one material carrier for the processing surface; and

a unit for generating at least one relative movement between the laser beams and the processing surface.

387. (Original) The apparatus for processing material according to claim 386 wherein the outputs of the fiber lasers are arranged in at least one of at least one track next to one another and in at least one plane above one another for forming the first ordering pattern.

388. (Original) The apparatus for processing material according to claim 386 wherein the outputs of the fiber lasers are arranged in a bundle for forming the first ordering pattern.

389. (Original) The apparatus for processing material according to claim 386 wherein the laser beams are combined and bundled for forming the second ordering pattern such that the laser beams generate processing points on the processing surface lying next to one another in one of at least one track and lying above one another in at least one plane.

390. (Original) The apparatus for processing material according to claim 386 wherein the laser beams are combined and bundled for forming the second ordering pattern such that the laser beams generate a single processing point on the processing surface.

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391. (Original) The apparatus for processing material according to claim 389 wherein for at least one of shaping and alignment of the laser beams, the outputs of the fiber lasers are correspondingly at least one of aligned and optically processed.

392. (Original) The apparatus for processing material according to claim 386 wherein for at least one of shaping and alignment of the laser beams, at least one optical unit is connected to the outputs of the fiber lasers.

393. (Original) The apparatus for processing material according to claim 386 wherein the laser beams generated in the fiber lasers are directly modulated.

394. (Original) The apparatus for processing material according to claim 392 wherein at least one modulation device is provided in the optical unit for modulation of the laser beams.

395. (Original) The apparatus for processing material according to claim 386 wherein a cooling system is provided for cooling the laser radiation source.

396. (Original) The apparatus for processing material according to claim 386 wherein an arrangement for removal of the material eroded from the processing surface is provided.

397. (Original) The apparatus for processing material according to claim 396 wherein at least one of a scraper and a brush device for respectively scraping and brushing off the eroded material arising in the processing of material is provided.

398. (Original) The apparatus for processing material according to claim 386 wherein at least some components of the apparatus are accommodated in a housing.

399. (Original) The apparatus for processing material according to claim 386 wherein the material carrier is designed as a drum.

400. (Original) The apparatus for processing material according to claim 386 wherein the material carrier is designed as a flat bed.

401. (Original) The apparatus for processing material according to claim 386 wherein the material carrier is designed as a hollow bed.

402. (Original) The apparatus for processing material according to claim 386 wherein the apparatus is designed for production of printing forms and the material to be processed is at least one of a printing cylinder and a printing plate.

403. (Currently Amended) A method for generating laser beams ~~with high power density and high energy~~ for engraving cups in a processing surface of a material, comprising the steps of:

providing at least one diode-pumped fiber laser;

providing each fiber laser with at least one output;

arranging in a first ordering pattern at least two of said outputs; and

at least one of shaping and aligning the laser beams emerging from the outputs of the individual fiber lasers such that they impinge onto ~~a~~ said processing surface in a second ordering pattern to engrave said cups by eroding a material of said processing surface, said laser beams having a power density and energy sufficiently high for eroding said material to create said cups.

404. (Original) The method according to claim 403, including the step of providing at least one optical unit connected to the output of the fiber lasers for at least one of the shaping and the alignment of the laser beams.

405. (Original) The method according to claim 403, including the step of directly modulating the laser beams generated in the fiber lasers.

406. (Currently Amended) The method according to claim 403, including the step of utilizing the generated laser beams having said ~~high-power~~ high power density and ~~high~~ energy for ~~processing material~~ eroding copper of a printing form.

407. (Currently Amended) The method according to claim 403 wherein the generated laser beams form a laser radiation source, and including the steps of cooling the laser radiation source with a cooling system, controlling the laser radiation source with a controller, utilizing the laser radiation source for processing the material, providing at least one material carrier for the processing surface, and generating at least one relative movement between the laser beams and the processing surface.

408. (New) The method according to claim 403 wherein the material comprises copper on a cylinder of a rotogravure engraving machine.

409. (New) A method for engraving cups in a copper material surface of a printing form, comprising the steps of:

providing at least one fiber laser;

providing each fiber laser with at least one output;

arranging in a first ordering pattern at least two of said outputs; and

at least one of shaping and aligning laser beams emerging from the outputs such that they impinge onto said processing surface in a second ordering pattern to

engrave said cups by eroding the copper material, said laser beams having a power density and energy sufficiently high for eroding said copper material to create said cups.

410. (New) The method according to claim 409 wherein the copper is melted and evaporated to create said cups.

411. (New) A method for generating laser beams for engraving cups in a processing surface of a material, comprising the steps of:

providing at least one fiber laser;

providing each fiber laser with at least one output;

arranging in a first ordering pattern at least two of said outputs; and

at least one of shaping and aligning laser beams emerging from the outputs so that they impinge onto said processing surface in a second ordering pattern to engrave said cups by eroding a material of said processing surface, said laser beams having a power density and energy sufficiently high for eroding said materials to create said cups, and said cups being created by a processing spot that is variable in shape and size.

412. (New) The method according to claim 411 wherein area and depth of the cups are varied independently of one another when engraving.

413. (New) The method according to claim 411 wherein the output of at least one of the fiber lasers supplies diffraction-limited radiation that is focused onto

a spot of less than a 10 μm diameter so that a high power density is achieved given a relatively large depth of field.

414. (New) The method according to claim 411 wherein a depth of the cups is determined by laser energy independently of the cups size and shape.

415 (New) The method according to claim 411 wherein the laser beams impinge a location on the processing surface next to one another in said second ordering pattern.

416. (New) The method according to claim 411 wherein the laser beams impinge a location on the processing surface over one another in said second ordering pattern.

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417. (New) The printing form engraving machine, comprising:

a printing form having a copper surface;

at least one fiber laser;

each fiber laser comprising at least one output;

at least two of said outputs being arranged in a first ordering pattern;

laser beams emerging from the outputs of the individual fiber lasers being at least one of shaped and aligned such that they impinge onto said processing surface in a second ordering pattern for engraving said cups; and

said emerging laser beams having a power density and energy which are sufficiently high to erode copper from said processing surface for creating said cups.

418. (New) Engraving machine according to claim 417 wherein the copper is on a surface of a rotary drum of a rotogravure engraving machine.

419. (New) The system according to claim 417 wherein said outputs are focused onto a spot having less than a 10 μm diameter.

420. (New) The laser radiation source according to claim 337 wherein said material comprises copper on a rotating cylinder of a rotogravure engraving machine.

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421. (New) The apparatus for processing material according to claim 386 wherein the material comprises copper on a cylinder of a rotogravure engraving machine.